



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,291	07/26/2006	Ferd Schuth	100716-62 KGB	7658
27387	7590	10/08/2009		
NORRIS, MCLAUGHLIN & MARCUS, P.A. 875 THIRD AVE 18TH FLOOR NEW YORK, NY 10022				
EXAMINER				
BUL DUNG H				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
10/08/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/564,291

**Applicant(s)**

SCHUTH ET AL.

**Examiner**

DUNG BUI

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF 298)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Information Disclosure Statement*

Applicants have not provided the missing copies as mentioned in Office Action date 03/09/09 and these documents have not been considered.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 4, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heung (US 6432379) in view of Ovshinsky (US 6478844).

Regarding claim 1, Heung discloses the claimed invention for material comprising a hydrogen storage component (Heung - abstract). Heung does not disclose the hydrogen storage component selected from (a) alkali alanate, (b) a mixture of aluminum metal with alkali metal and/or alkali metal hydride, (c) magnesium hydride, and (d) mixtures of any of (a) – (c), wherein the hydrogen storage component is

encapsulated in a porous matrix. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have the hydrogen storage component selected from (a) alkali alanate, (b) a mixture of aluminum metal with alkali metal and/or alkali metal hydride, (c) magnesium hydride, and (d) mixtures of any of (a) – (c), wherein the hydrogen storage component is encapsulated in a porous matrix, since it is well known in the art as taught in US 6478844 (Ovshinsky – column 4, lines 25-43), US 6328821, and US 20030162059 that the substitution of one hydride to another for the same purpose.

Regarding claim 4, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention for wherein the hydrogen storage component comprises a transition metal, transition metal compound, rare-earth metal and/or rare-earth metal compound (Heung - column 5, lines 33-48).

Regarding claim 7, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention for a vehicle comprising a fuel cell system supplied with hydrogen from a material according to claim 1 (Heung - column 1, lines 22-25).

Regarding claim 9, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention for a method of storing and releasing hydrogen, comprising: a) providing a material according to claim 1; and b) storing and releasing hydrogen from said material (Heung - abstract).

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heung (US 6,432,379) in view of Ovshinsky (US 6478844) as applied to claim 1 above, and further in view of Antonelli (US 7,078,130).

Regarding claim 2, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention except for wherein said porous matrix is selected from solid inorganic materials. Antonelli teaches that it is known to have wherein said porous matrix is selected from solid inorganic materials (Antonelli – column 1, lines 33-41). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide wherein said porous matrix is selected from solid inorganic materials as taught by Antonelli in order to have low cost and thermal stability.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heung (US 6,432,379) in view of Ovshinsky (US 6478844) as applied to claim 1 above, and further in view of MacGillivray (US 2009/0000474).

Regarding claim 3, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention except for wherein said porous matrix comprises porous metal organic frameworks. Macgillivray teaches that it is known to have said porous matrix comprises porous metal organic frameworks (abstract). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide said porous matrix comprises porous metal organic frameworks as taught by MacGillivray in order to improve storage efficiency.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heung (US 6,432,379) in view of Ovshinsky (US 6478844) and DeFilippi et al (US 5,503,738).

Regarding claim 5, Heung discloses the claimed invention for material comprising a hydrogen storage component (Heung - abstract). Heung does not disclose the hydrogen storage component selected from (a) alkali alanate, (b) a mixture of aluminum metal with alkali metal and/or alkali metal hydride, (c) magnesium hydride, and (d) mixtures of any of (a) – (c), wherein the hydrogen storage component is encapsulated in a porous matrix. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have the hydrogen storage component selected from (a) alkali alanate, (b) a mixture of aluminum metal with alkali metal and/or alkali metal hydride, (c) magnesium hydride, and (d) mixtures of any of (a) – (c), wherein the hydrogen storage component is encapsulated in a porous matrix, since it is well known in the art as taught in US 6478844 (Ovshinsky – column 4, lines 25-43), US 6328821, and US 20030162059 that the substitution of one hydride to another for the same purpose.

Also regarding claim 5, Heung as modified does not disclose the steps of impregnating a porous matrix material with a solution and/or suspension of said hydrogen storage components in an organic solvent and removing the organic solvent. DeFilippi et al teaches that it is known to have the steps of impregnating a porous matrix material with a solution and/or suspension of said hydrogen storage components in an organic solvent and removing the organic solvent (DeFilippi et al - column 7, lines 1-5). It would have been obvious to one having ordinary skill in the art at the time of the

invention was made to inherent the steps of impregnating a porous matrix material with a solution and/or suspension of said hydrogen storage components in an organic solvent and removing the organic solvent as taught by DeFilippi et al in order to have a capacity of absorbing more than one pollutants.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heung (US 6,432,379) in view of Ovshinsky (US 6,478,844) as applied to claim 2 above, and further in view of Golben (US 6,508,866).

Regarding claim 8, Heung as modified discloses all of limitation as set forth above. Heung as modified discloses the claimed invention except for wherein said solid inorganic materials are selected from the group consisting of porous carbon, mesostructured carbon, carbon xerogel, carbon aerogel, silica aerogel, silica xerogel, and zeolite. Golben teaches that it is known to have wherein said solid inorganic materials are selected from the group consisting of porous carbon, mesostructured carbon, carbon xerogel, carbon aerogel, silica aerogel, silica xerogel, and zeolite (column 1, lines 45-53). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to have said solid inorganic materials are selected from the group consisting of porous carbon, mesostructured carbon, carbon xerogel, carbon aerogel, silica aerogel, silica xerogel, and zeolite as taught by Golben in order to increase composite material performance.

#### ***Response to Arguments***

8. Applicant's arguments filed 7/9/09 have been fully considered but they are not persuasive. Applicant's remark that Heung does not teach the features of claim 1. In

fact, Heung discloses La-Ni-AIH and Lm-Ni-AIH. However, it is known magnesium hydride is well known in the art (US 6478844, US 6328821, and US 20030162059) that substitute one metal hydride with other for the same purpose.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUNG BUI whose telephone number is (571)270-7077. The examiner can normally be reached on Mon. - Thurs., 7:30 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason M. Greene/  
Primary Examiner, Art Unit 1797

/D. B./  
Examiner, Art Unit 1797